# Curriculum Vitae

**PD Dr. Lars Michels**

## Personal Data


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| Name: | Lars Michels |
| Adress: | Sternwartstr. 6, University Hospital Zurich, 8091 Zurich, Switzerland |
| Telephone: | +41-044-255-4965 (office) |
| Email: | **lars.michels@usz.ch** |
| Date of birth: | 09. November 1976 |
| Nationality: | German |
| Marital status: | married, 2 children |

**Education**

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|---|---|
| 11/18 | Group Leader, Neuroscience Center Zurich<br>University of Zurich (Switzerland) |
| 05/18 | Head of Basic Research, Department of Neuroradiology<br>University Hospital Zurich (Switzerland) |
| 03/18 | Invited talk (candidate on short-list) for a W2/W3 Professorship<br>(Multimodale Bildgebung in der klinischen Forschung,<br>Medical Faculty, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany) |
| 04/17 | Life tenure position, Senior MR Scientist ('Oberassistent'), Department of Neuroradiology,<br>University Hospital Zurich (Switzerland) |
| 12/15 | Habilitation (Venia Legendi), Medical Faculty, University of Zurich<br>Title: Multimodal functional neuroimaging during resting-state and working memory operations<br>in the developing and adult brain |
| 10/14 | Invited talk (candidate on short-list) for a Tenure Track Professorship<br>(Human Neuronal Plasticity) at the Institute of Neuropsychology, University of Zurich, Switzerland |
| 09/12 – 12/12 | Visiting Fellow (2nd visit) at the Stanford School of Medicine, Prof. V. Menon<br>(Stanford University, USA) |
| since 10/10 | Senior MR scientist ('Oberassistent')<br>Prof. A. Valavanis and Prof. S. Kollias (Department of Neuroradiology, University Hospital Zurich) |
| 09/11 – 12/11 | Visiting Fellow (1st visit) at the Stanford School of Medicine, Prof. V. Menon<br>(Stanford University, USA) |
| 06/08 – 10/12 | Postdoctoral researcher. Projects:<br>1) Thalamo-cortical interactions in brain state regulation and during epilepsy (06/08 - 12/10)<br>2) Linking the major system markers for typical and atypical brain development:<br>a multimodal imaging and spectroscopy study (01/11 - 10/12)<br>Topics: EEG-fMRI, spectroscopy (GABA), ASL, cognition, rest |
| 06/08 | Dissertation. Title: 'Cortical activation by a biological motion stimulus<br>with limited lifetime' |
| 09/02 – 12/02 | Guest Researcher at the Brain and Vision Research Laboratory, Prof. L. M. Vaina<br>(Boston and Harvard University, USA) |
| 06/02 – 06/08 | PhD student at the Department of Psychology, Prof. M. Lappe<br>(Westfälische-Wilhelms University, Münster, Germany) |
| 03/02 | Diploma in Biology (M.Sc.) from the Ruhr-University Bochum (Germany),<br>Prof. K. Hoffmann. Title: 'The perception of visual stimuli during saccadic eye movements' |

**Publication summary, h-index, i10-index, and citations**

| *Publication summary* | *total* |
|---|---|
| First-author papers | 30 |
| Last-author papers | 17 |

| *Year* | *h-index* | *i10-index* | *Citations* |
|---|---|---|---|
| Since 2015 | 26 | 53 | 2123 |
| all | 31 | 56 | 2828 |

**Peer-reviewed publications**

[1] L. Michels, L., M. Lappe (2004). Contrast dependency of saccadic compression and suppression. **Vision Res**. 2004; 44(20):2327-36. *Impact factor (IF): 2.1*

[2] L. Michels, M. Lappe, L.M. Vaina (2005). Visual areas involved in the perception of human movement from dynamic form analysis. **Neuroreport**. 2005 Jul 13;16(10):1037-41. *IF: 1.9*

[3] de Lussanet M, Fadiga L, Michels L Seitz R, Kleiser R, Lappe M. (2008). Interaction of visual hemifield and body view in biological motion perception. **European Journal of Neuroscience**. 2008 Jan; 27(2): 514-522. *IF: 3.7*

[4] Michels L, Moazami-Goudazi M, Jeanmonod D, Sarnthein J. (2008). EEG alpha distinguishes between cuneal and precuneal activation in working memory. **NeuroImage**. 2008 Apr 15; 40(3): 1296-1310. *IF: 5.7*

[5] Moazami-Goudazi M, Sarnthein J, Michels L, Moukhtieva R, Jeanmonod D. (2008). Enhanced frontal low and high frequency power and synchronization in the resting EEG of parkinsonian patients. **NeuroImage**. 2008 Jul 1; 41(3): 985-997. *IF: 5.7*

[6] Mehnert U, Boy S, Svensson J, Michels L, Reitz A, Candi V, Kleiser R, Kollias S, Schurch B. (2008). Brain activation in response to bladder filling and simultaneous stimulation of the dorsal clitoral nerve - An fMRI study in healthy woman. **NeuroImage**. 2008 Jul 1; 41(3): 682-689. Processing and statistical analysis of the fMRI data. *IF: 5.7*

[7] Michels L, de Lussanet M, Fadiga L, Seitz R, Kleiser R, Lappe M. (2009). Brain activity for peripheral biological motion in the posterior superior temporal gyrus and the fusiform gyrus: Dependence on visual hemifield and view orientation. **NeuroImage**. 2009 Mar; 45(1): 151-159. *IF: 5.7*

[8] Michels L, Mehnert U, Boy S, Schurch B, Kollias S. (2010). The somatosensory representation of the human clitoris: an fMRI study. **NeuroImage**. 2010 Jan 1; 49(1): 177-184. *IF: 5.7*

[9] Zempleni MZ, Michels L, Mehnert U, Schurch B, Kollias S. (2010). Cortical substrate of urinary bladder in spinal cord injury and the effect of pudendal stimulation. **NeuroImage**. 2010 Feb 15; 49(4): 2983-2994. *IF: 5.7*

[10] Moazami-Goudazi M, Michels L, Weisz N, Jeanmonod D. (2010). Temporo-insular enhancement of EEG low and high frequencies in patients with chronic tinnitus. QEEG study of chronic tinnitus patients. **BMC Neuroscience**. 2010 Mar 24;11:40. *IF: 2.9*

[11] Michels L, Bucher K, Martin E, Jeanmonod D, Brandeis D. (2010). Simultaneous EEG-fMRI during a

working memory task: Modulations in low and high frequency bands. **PLoS One**. 2010 Apr 22;5(4):e10298. *IF: 4.4*

[12] Mehnert U, Michels L, Zempleni MZ, Schurch B, Kollias S. (2010). The supraspinal neural correlate of bladder cold sensation - An fMRI study. **Human Brain Mapping**. 2011 Jun;32(6):835-45. doi: 10.1002/hbm.21070. *IF: 5.4*

[13] Michels L, Bucher K, Brem S, Halder P, Lüchinger R, Liechti M, Martin E, Jeanmonod D, Kroell J, Brandeis D. (2010). Does greater low frequency EEG activity in normal immaturity and in children with epilepsy arise in the same neuronal network? **Brain Topography**. 2011 Mar;24(1):78-89. *IF: 3.4*

[14] O'Gorman R, Michels L, Edden, RA, Martin E. (2011). In vivo detection of GABA and glutamate with MEGA-PRESS: reproducibility and gender effects. **J of Magnetic Resonance Imaging**. 2011 May;33(5):1262-7. doi: 10.1002/jmri.22520. *IF: 2.8*

[15] Lüchinger R*, Michels L*, Martin E, Brandeis D. (2011). EEG-BOLD coupling during late brain maturation. **NeuroImage**. 2011 Jun 1;56(3):1493-505. Epub 2011 Feb 22. *IF: 5.9*. *shared first authors.

[16] Michels L, Moazami-Goudazi M, Jeanmonod D. (2011). Correlations between EEG and clinical outcome in chronic neuropathic pain: surgical effects and treatment resistance. **Brain Imaging and Behavior**. 2011 Dec;5(4):329-48. *IF: 2.7*

[17] Lüchinger R, Michels L, Martin E, Brandeis D. (2011). Brain state regulation during normal development: intrinsic activity fluctuations in simultaneous EEG-fMRI. **NeuroImage**. 2012 Apr 2;60(2):1426-39. Epub 2012 Jan 10. *IF: 5.9*

[18] Jeanmonod D, Werner B, Morel A, Michels L, Zadicario E, Schiff G, Martin E. (2011). Transcranial MR-guided Focused Ultrasound: Non-invasive Central Lateral Thalamotomy against Chronic Neuropathic Pain. **Neurosurgical Focus**. 2012 Jan;32(1):E1. *IF: 2.3*

[19] Michels L, Martin E, Klaver P, Edden R, Zelaya F, Lythgoe DJ, Lüchinger R, Brandeis D, O'Gorman R. (2012). Frontal GABA levels change during working memory. **PLoS ONE**. 7(4):e31933. *IF: 4.2*

[20] Michels L, Lüchinger R, Koenig T, Martin E, Brandeis D (2012). Similar development of opposite correlation between human EEG power and synchronization with the BOLD signal during short-term memory. **PLoS ONE**. 7(7):e39447. Epub 2012 Jul 6. *IF: 4.2*

[21] O'Gorman R, Poil SS, D. Brandeis, Klaver P, Bollmann S, Ghisleni C, Lüchinger R, Martin E, Shankaranarayanan A, Alsop DC, Michels L (2012). Coupling between resting cerebral perfusion and EEG. **Brain Topography**. 26(3):442-57. *IF: 3.4*

[22] L. Michels, M. Muthuraman, R. Lüchinger, E. Martin, A.R. Anwar, J. Raethjen, D. Brandeis, M. Siniatchkin (2013). Developmental changes of functional and directed connectivity associated with neuronal oscillations in EEG. **NeuroImage**. 81:231-42. *IF: 6.8*

[23] C. Mueller-Pfeiffer, T. Zeffiro, R. O'Gorman, L. Michels, P. Baumann, N. Wood, J. Spring, M. Rufer, R.K. Pitman, S.P. Orr (2014). Cortical and Cerebellar Modulation of Autonomic Responses to Salient Sounds. **Psychophysiology**. 51(1):60-9. *IF: 3.3*

[24] C. Mueller-Pfeiffer, T. Schick, M. Schulte-Vels, R. O'Gorman, L. Michels, C. Martin-Soelch, J.R. Blair, M. Rufer, U. Schnyder, T. Zeffiro, G. Hasler (2013). Atypical Visual Processing in Posttraumatic Stress

Disorder. **NeuroImage: Clinical**. Aug 29;3:531-8. doi: 10.1016/j.nicl.2013.08.009.

[25] V. Dietz, G. Macauda, M. Schrafl-Altermatt, M. Wirz, E. Kloter, L. Michels (2015). Neural coupling of cooperative hand movements: a reflex and fMRI study. **Cerebral Cortex**. 25(4):948-58. *IF: 6.8*

[26] D. Wotruba, L. Michels, R. Buechler, S. Metzler, A. Theodoridou, M. Gerstenberg, S. Walitza, S. Kollias, W. Rössler, K. Heekeren (2013). Aberrant coupling within and across the default-mode, task-positive, and salience network in subjects at risk for psychosis. **Schizophrenia Bulletin**. Sep;40(5):1095-104. *IF: 8.5*

[27] S.S. Poil, S. Bollmann, C. Ghisleni, R.L. O'Gorman, P. Klaver, J. Ball, D. Eich-Höchli, D. Brandeis*, L. Michels * (2013). Age dependent electroencephalographic changes in Attention Deficit/Hyperactivity Disorder (ADHD). **Clinical Neurophysiology**. 125(8):1626-38. *IF: 3.1.* *shared senior authors

[28] U. Maurer, S. Brem, M. Liechti, S. Maurizio, L. Michels, D. Brandeis (2014). Frontal midline theta reflects experienced task difficulty in a working memory task. **Brain Topography**. 28(1):127-34. *IF: 3.7*

[29] M. Walter, L. Michels, S. Kollias, P.E. van Kerrebroeck, T. Kessler, U. Mehnert (2014). Protocol for a prospective neuroimaging study investigating the supraspinal control of lower urinary tract function in healthy controls and patients with non-neurogenic lower urinary tract symptoms. **BMJ Open**. 4(6):e004357. *IF: 2.6*

[30] L. Michels, B.F. Blok, F. Gregorini, M. Kurz, B. Schurch, T.M. Kessler, S. Kollias, U. Mehnert (2015). Supraspinal control of urine storage and micturition in men- an fMRI study. **Cerebral Cortex**. 25(10):3369-80. *IF: 6.8*

[31] F. Riese, A. Gietl, N. Zoelch, A. Henning, R. O'Gorman, A.M. Kaelin, S.E. Leh, A. Buck, G. Warnock, R.A. Edden, R. Luechinger, C. Hock, S. Kollias, L. Michels (2014). Posterior cingulate GABA and glutamate+glutamine are reduced in amnestic mild cognitive impairment and are unrelated to amyloid deposition and APOE genotype. **Neurobiol Aging**. 36(1):53-9. *IF: 6.2*

[32] L. Michels, T. Schulte-Vels, M. Schick, R. O'Gorman, G. Hassler, C. Mueller-Pfeiffer. (2014). Prefrontal GABA and gluthatione imbalance in posttraumatic stress disorder: Preliminary findings. **Psychiatry Research: Neuroimaging**. 224(3):288-95. *IF: 3.4*

[33] T. Chen*, L. Michels*, S. Ryali, V. Menon (2015). Role of the anterior insular cortex in integrative causal signaling during multisensory auditory-visual attention. **European Journal of Neuroscience**. 41(2):264-74. *IF: 3.8.* *shared first authors

[34] L. Jäger, L. Marchal-Crespo, P. Wolf, R. Riener, L. Michels*, S, Kollias* (2014). Brain activation associated with active and passive lower limb stepping. **Frontiers in Human Neuroscience**. Oct 28;8:828. *IF: 2.9.* *shared senior authors

[35] D. Wotruba, K. Heekeren, L. Michels, R. Büchler, J.J. Simon, A. Theodoridou, S. Kollias, W. Rössler, S. Kaiser (2014). Symptom dimensions are associated with reward processing in unmedicated persons at risk for psychosis. **Frontiers in Behavioral Neuroscience**. Nov 18;8:382. doi: 10.3389/fnbeh.2014.00382. eCollection 2014. *IF: 4.2.*

[36] C. Ghisleni, S. Bollmann, S.S. Poil, D. Brandeis, E. Martin, L. Michels, R.L. O'Gorman, P. Klaver (2015). Subcortical glutamate mediates the reduction of short-range functional connectivity with age in a developmental cohort. **The Journal of Neuroscience**. Jun 3;35(22):8433-41. *IF: 6.7.*

[37] M. Kottlow, A. Schlaepfer, A. Baenninger, L. Michels, D. Brandeis, T. Koenig (2015). Pre-stimulus BOLD-network activation modulates EEG spectral activity during working memory retention. **Frontiers in Behavioral Neuroscience**. May 6;9:111. doi: 10.3389/fnbeh.2015.00111. eCollection 2015. *IF: 4.2.*

[38] S. Bollmann, C. Ghisleni, S.S. Poil, E. Martin, J. Ball, D. Eich-Höchli, R.A. Edden, P. Klaver, L. Michels, D. Brandeis, R.L. O'Gorman (2015). Developmental changes in gamma-aminobutyric acid levels in attention-deficit/hyperactivity disorder (ADHD). **Translational Psychiatry**. Jun 23;5:e589. doi: 10.1038/tp.2015.79. *IF: 4.3.*

[39] L. Jaeger, L. Marchal-Crespo, P. Wolf, A.R. Luft, R. Riener, L. Michels*, S. Kollias* (2016). On the modulation of brain activation during simulated weight bearing in supine gait-like stepping. **Brain Topography**. Jan;29(1):193-205. *IF: 2.5.* *shared senior authors

[40] L. Michels*, G. Warnock*, A. Buck, G. Macauda, S.E. Leh, A.M. Kaelin, F. Riese, R. Meyer, R.L. O'Gorman, C. Hock, S. Kollias, A. F. Gietl (2016). Arterial spin labeling imaging reveals widespread and amyloid-independent reductions in cerebral blood flow in elderly apolipoprotein epsilon-4 carriers. **Journal of Cerebral Blood Flow and Metabolism**. Mar;36(3):581-95. *IF: 5.3.* *shared first authors

[41] C. Ghisleni, S. Bollmann, A. Biason-Lauber S.S. Poil, D. Brandeis, E. Martin, L. Michels, M. Herberger, P. Klaver, R. O'Gorman (2015). Effects of Steroid Hormones on Sex Differences in Cerebral Perfusion. 10(9):e0135827. doi: 10.1371/journal.pone.0135827. *Accepted. IF: 3.5*

[42] B. Jarrahi, D. Mantini, J.H. Balsters, L. Michels, T. Kessler, U. Mehnert, S. Kollias (2015). Differential functional brain network connectivity during visceral interoception as revealed by independent component analysis of fMRI time-series. **Hum Brain Mapping**. 36(11):4438-68. *IF: 5.9*

[43] S.E. Leh, A.M Kaelin, C. Schroeder, M.M. Park, M. Chakravarty, P. Freund, A.F. Gietl, F. Riese, S. Kollias, C. Hock, L. Michels (2015). Volumetric and shape analysis of the thalamus and striatum in amnestic mild cognitive impairment. **Journal Alzheimer's Disease**. 49(1):237-49. *IF: 4.2*

[44] L. Jaeger, L. Marchal-Crespo, P. Wolf, R. Riener, S. Kollias*, L. Michels* (2015). Test-retest reliability of fMRI experiments during robot-assisted active and passive stepping. **Journal of Neuro Engineering and Rehabilitation**. 12(1):102. *IF: 2.6.* *shared senior authors

[45] S. Bollmann, C. Ghisleni, S.S. Poil, E. Martin, J. Ball, D. Eich-Hoechli, P. Klaver, R.L. O'Gorman, L. Michels*, D. Brandeis* (2017). Age-dependent and independent changes in attention-deficit/hyperactivity disorder (ADHD) during spatial working memory performance. **World J Biol Psychiatry**. Jun;18(4):279-290. *IF: 3.7.* *shared senior authors

[46] L. Michels, F. Christidi, V.R. Steiger, P.S. Sandor, A. Gantenbein, G. Landmann, S.R. Schreglmann, S. Kollias, F. Riederer (2016). Pain modulation is affected differently in medication overuse headache and chronic myofascial pain: A multimodal MRI study. **Cephalalgia**. Accepted. pii: 0333102416652625. *IF: 4.9*

[47] J. Brand, M. Piccirelli, M.-C. Hepp-Reymond, M. Morari, L. Michels*, K. Eng* (2016). Virtual Hand Feedback Reduces Reaction Time in an Interactive Finger Reaching Task. **PLoS ONE**. May 4;11(5):e0154807. *IF: 3.2.* *shared senior authors

[48] B. Jarrahi, R. Gassert, J. Wanek, L. Michels, U. Mehnert, S. Kollias (2016). Design and Application of a New Automated Fluidic Visceral Stimulation Device for Human fMRI Studies of Interoception. **Journal of Translational Engineering in Health and Medicine**. Online, April 1 (2016). *IF: open access journal.*

[49] L. Michels*, S. Scherpiet*, P. Stämpfli, A.B. Bruehl (2016). Baseline perfusion alterations after acute application of quetiapine and pramipexole in healthy adults. **The International Journal of Neuropsychopharmacology**. doi: 10.1093/ijnp/pyw067. *IF: 4.0.* *shared first authors

[50] S.J. Schreiner, T.A. Kirchner, M. Wyss, J.M. van Bergen, F.C. Quevenco, S.C. Steininger, E.Y. Griffith, I. Meier, L. Michels, A.F. Gietl, S. Leh, A.M. Brickman, C. Hock, R.M. Nitsch, K.P. Pruessmann, P.G. Unschuld (2016). Low episodic memory performance in cognitively normal elderly subjects is associated with increased posterior cingulate gray matter N-acetylaspartate: A 1H MRSI Study at 7 Tesla. **Neurobiol Aging**. 31;48:195-203. *IF: 5.2.*

[51] L. Leitner, M. Walter, B. Jarrahi, J. Wannek, J. Diefenbacher, L. Michels, M.D. Liechti, S. Kollias, T.M. Kessler, U. Mehnert (2016). A novel infusion-drainage device to assess lower urinary tract function in neuro-imaging. **BJU Int**. Accepted. *IF: 4.4.*

[52] C. Schroeder, M.T. Park, J. Germann, M.M. Chakravarty, L. Michels, S. Kollias, S. Kroll, A. Buck, V. Treyer, E. Savaskan, P.G. Unschuld, R. Nitsch, A. Kaelin, C. Hock, A.F. Gietl, S. Leh (2016). Hippocampal shape alterations are associated with regional amyloid load in cognitively normal elderly individuals. **European Journal of Neuroscience**. doi: 10.1111/ejn.13408. *IF: 3.0.*

[53] F. Riederer*, M. Schaer*, A.R. Gantenbein, R. Luechinger, L. Michels, M. Kaya, S. Kollias, P.S. Sandor (2016). Cortical alterations in medication-overuse headache. **Headache**. doi: 10.1111/head.12993. *IF: 3.2.* *shared first authors

[54] D. Perruchoud*, L. Michels*, R. Gassert, S. Ionta (2016). Differential neural encoding of sensorimotor and visual body representations. **Scientific Reports**. Nov 24;6:37259. *IF: 5.2.* *shared first authors

[55] A.M. Kälin, M.T.M. Park, M.M. Chakravarty, J.P. Lerch, L. Michels, C. Schroeder, S.D. Broicher, S Kollias, R.M. Nitsch, A. F. Gietl, P.G. Unschuld, C. Hock, S.E. Leh-Seal (2017). Subcortical Shape Changes, Hippocampal Atrophy and Cortical Thinning in Future Alzheimer's Disease Patients. **Frontiers in Aging Neuroscience**. Mar 7;9:38. *IF: 4.3*

[56] L. Michels, R. O'Gorman, K. Kucian (2017). Functional hyperconnectivity vanishes in children with developmental dyscalculia after numerical intervention. **Developmental Cognitive Neuroscience**. 2017 Mar 21. pii: S1878-9293(16)30240-7. doi: 10.1016/j.dcn.2017.03.005. *IF: 4.0.*

[57] J. Brand*, L. Michels*, R. Bakker, M.-C. Hepp-Reymond, M. Morari, D. Kiper, K. Eng (2017). Neural correlates of visuomotor adjustments during scaling of human finger movements. **European Journal of Neuroscience**. Jul;46(1):1717-1729. *IF: 3.0.* *shared first authors

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[59] C.R. Lewis, K.H. Preller, R. Kraehenmann, L. Michels, P. Stämpfli, F.X. Vollenweider (2017). Two Dose Investigation of the 5-HT-agonist psilocybin on regional and global cerebral blood flow. **NeuroImage**. Oct 1;159:70-78. *IF: 5.8*

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[61] L. Marchal-Crespo, L. Michels, L. Jaeger, J. Lopez-Oloriz, R. Riener (2017). Effect of robotic error augmentation on motor skill learning and brain activation. **Frontiers in Neuroscience (section Neural Technology)**. Sep 27;11:526. doi: 10.3389/fnins. *IF: 3.4*

[62] S. Winklhofer, R. Hinzpeter, D. Stocker, G. Baltsavias, L. Michels, J.K. Burkhardt, L. Regli, A. Valavanis, H. Alkadhi (2018). Combining Monoenergetic Extrapolations from Dual-Energy CT with Iterative Reconstructions: Reduction of Coil and Clip Artifacts from Intracranial Aneurysm Therapy. **Neuroradiology**. 2018 Mar;60(3):281-291. *IF: 2.1.*

[63] K. Schneider*, L. Michels*, M.N. Hartmann-Riemer, P.N. Tobler, P. Stämpfli, M. Kirschner, E. Seifritz, S. Kaiser (2018). Cerebral blood flow in striatal regions is associated with apathy in patients with schizophrenia. **Journal of Psychiatry and Neuroscience**.Sep 7;43(6):170150. doi: 10.1503/jpn.170150.*IF: 5.2.* *shared first authors

[64] N. Aldusary, L. Michels*, G. Traber, B. Hartog-Keisker, M. Wyss, A. Baeshen, K. Huebel, Y. Edrees Almalki, D.O. Brunner, K.P. Pruessmann, K. Landau, S. Kollias, M. Piccirelli (2018). Lateral Geniculate Nucleus Volume Determination at 3T and 7T: Four Different Optimized Magnetic-Resonance-Imaging Sequences Evaluated against a New Reference acquisition. **NeuroImage**. Oct 17;186:399-409. *IF: 5.8.* *shared first authors

[65] F. Wehrle*, L. Michels*, B. Latal, R. Huber, R. Guggenberger, R. O'Gorman, C. Hagmann (2018). Functional connectivity differences between term born and very preterm born adolescents. **NeuroImage Clinical**. 20:1148-1156. doi: 10.1016/j.nicl.2018.10.002. *IF: 3.9.* *shared first authors

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[67] M. Walter*, L. Leitner*, L. Michels*, P. Freund, M. Liechti, S. Kollias, T.M. Kessler, U. Mehnert (2019). Repeatability of supraspinal activity to lower urinary tract stimulation in healthy subjects – A fMRI study. **NeuroImage**. 191:481-492. *IF: 5.4.* *shared first authors

[68] G. Macauda, M. Moisa, F.W. Mast, C. Ruff, L. Michels*, B. Lenggenhager* (2019). Shared neural mechanisms between imagined and perceived egocentric motion. **Cortex**. Apr 12;119:20-32. doi: 10.1016/j.cortex.2019.04.004. *IF: 4.3.** Shared last-authorship

[69] L. Michels, J. Villanueva, R. O'Gorman, A. Gantenbein, P. Sandor, R. Lüchinger, S. Kollias, F. Riederer. Interictal hyperperfusion in the higher visual cortex in patients with episodic migraine. **Headache**. 59(10):1808-182. *IF: 3.1.*

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*IF: 4.6.*

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[74] T.A.W. Bolton, D. Wotruba, R. Buechler, A. Theodoridou, L. Michels, S. Kollias, W. Rössler, K. Heekeren, D. Van de Ville (2020). Triple network model dynamically revisited: lower salience network state switching in pre-psychosis. **Front Phys**. 11:66.doi: 10.3389/fphys.2020.00066. eCollection 2020. *IF: 3.2.*

[75] U. Mehnert, S. van der Lely, M. Seif, L. Leitner, M. Liechti, L. Michels (2020). Mini Review: neuorimaging in neuro-urology. **European Urology Focus**. S2405-4569(19)30384-0. doi: 10.1016/j.euf.2019.12.00. *IF: 4.8.*

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[77] R. Buechler, D. Wotruba, L. Michels, S. Metzler, S. Walitza, S. Kollias, W. Roessler, K. Heekeren (2020). Cortical Volume Differences in Subjects at Risk for Psychosis Are Driven by Surface Area. **Schizophrenia Bulletin**. sbaa066. doi: 10.1093/schbul/sbaa066. *IF: 7.3.*

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[79] J. Brand, M. Piccirelli, M.C. Hepp-Reymond, K. Eng, L. Michels (2020). Brain activation during visually guided finger movements. **Front. Hum. Neurosci**. *Accepted. IF: 2.9.*

[80] G.S.P. Pamplona, J. Heldner, R. Langner, Y. Koush, L. Michels, S. Ionta, F. Scharnowski, C.E.G. Salmon (2020). Network-based fMRI-neurofeedback training of sustained attentiony. **NeuroImage**. *Accepted. IF: 5.8*

[81] J. Reinhardt*, O. G. Rus*, C. N. Bürki, S. A. Bridenbaugh, S. Krumm, L. Michels, C. Stippich, R. W. Kressig, M. Blatow (2020). Neural Correlates of Stepping in Healthy Elderly: Parietal and Prefrontal Cortex Activation Reflects Cognitive-Motor Interference Effect. **Front. Hum. Neurosci. (Motor Neuroscience)**. Sep 29;14:566735. doi: 10.3389/fnhum.2020.566735. eCollection 2020. *IF: 2.8* .*shared first authors

[82] H. Pohl, M. Moisa, H.H. Jung, K. Brenner, J. Aschmann, F. Riederer, C.C. Ruff, J. Schoenen, R. Luechinger. L. Widmer, J.A. Petersen, A.R. Gantenbein, P.S. Sandor, L. Michels (2020). Long-Term Effects of Self-Administered Transcranial Direct Current Stimulation in Episodic Migraine Prevention: Results of a Randomized Controlled Trial. **Neuromodulation**. Oct 19. doi: 10.1111/ner.1329. *IF: 4.03.*

[83] N. Aldusary, G.L. Traber, P. Freund, F.C. Fierz, K.P. Weber, A. Baeshen, J. Alghamdi, B. Saliju, S. Pazahr, R. Mazloum, F. Alshehri, K. Landau, S. Kollias, M. Piccirelli, L. Michels. Visual snow patients show functional hyperconnectivity and structural abnormalities. **Front. Hum. Neurosci. (Brain Imaging and Stimulation)**. *Accepted. IF: 2.9*

**Publications - under review or in preparation**

[1] L. Michels, R. Buechler, R. O'Gorman, K. Kucian (2020). Structural hyperconnectivity in children with developmental dyscalculia. **Human Brain Mapping**. *Major revisions. IF: 4.6.*

[2] G. Saetta, L. Michels, P. Brugger (2020). Mamma mia! Mapping the neural networks of somatoparaphrenia, and the mother's hand in the brain. Cortex. *Under Review.*

[3] M. Walter*, L. Leitner*, C. Betschart, D.S. Engeler, P. Freund, T.M. Kessler, S. Kollias ,M. Liechti, D.A. Scheiner, L. Michels*, U. Mehnert* (2020). Differences in supraspinal activity between women with overactive bladder and healthy controls in response to bladder distention and cold stimulation. The Journal of Urology. *Major Revisions.* IF 4.8. *shared last authors

[4] V. Huynh, R. Lütholf,J. Rosner, A. Curt, S. Kollias, R. Luechinger, M. Hubli*, L. Michels* (2020). Conditioned pain modulation is associated with increased resting-state functional connectivity and structure of pain modulatory regions. *xxx. xxx. IF: xx.* *shared last authors

[5] V. Huynh, P. Staempfli, R. Lütholf, R. Luechinger, A. Curt, S. Kollias, M. Hubli*, L. Michels* (2020). Investigation of cerebral white matter changes after spinal cord injury with a measure of fiber density. *Front. Neurol. (Applied Neuroimaging). Major Revisions. IF: 2.9*

[6] L. Michels, F. Riese, R. Meyer, A.M. Kaelin, S.E. Leh, R. Lüchinger, S. Leh, S. Kollias, C. Hock, A. Gietl (2020). Abnormal EEG-fMRI signal coupling in patients with mild cognitive impairment. **Front. Aging Neurosci.**. *Under Review. IF: 4.4*

[7] L. Michels*, C. Schroeder*, S.E. Leh, A. Gietl, C. Hock, S. Kollias. Informing participants about the study purpose: A hidden peril in studies of resting state fMRI connectivity? *In preparation.* *shared first authors

[8] L. Michels*, N. Koirala*, S. Groppa, R. Luechinger, A.R. Gantenbein, P.S. Sandor, S. Kollias, F. Riederer**, M. Muthuraman** (2020). Structural Brain Network Characteristics in Patients With Episodic and Chronic Migraine. *BMC: The Journal of Headache and Pain. Under Review. IF: 4.8* *shared first authors, **shared last authors

[9] L. Michels, A. Buchmann, R. Meyer, P. Freund, A. Buck, G. Warnock, F. Riese, R. O'Gorman, R. Lüchinger, S. Leh, S. Kollias, C. Hock, A. Gietl. Longitudinal changes in cerebral blood flow in patients with mild cognitive impairment using arterial spin labelling. *in preparation.*

[10] R. Buechler, D. Wotruba, L. Michels, S. Metzler, S. Walitza, S. Kollias, W. Roessler, K. Heekeren (2020). Altered Structural Covariance in Subjects at Risk for Psychosis: Trapped in Immature Networks? *In preparation.*

[11] L. Michels, P. Stämpfli, S. Hirsiger, W. Surbeck, E. Seifritz, B. Quednow (2020). The impact of levamisole and the role of fiber density in adult cocaine users: a diffusion tensor imaging study. *In preparation.*

[12] L. Michels*, D.M. Baur*,S. Bollmann, S.M. Lanphier, A. Schläpfer, M. Schneebeli, S.S. Poil, C. Ghisleni, P. Klaver, R. O'Gorman, D. Brandeis (2020). ADHD-related alterations in resting-state EEG-fMRI signal coupling. *In preparation.* *shared first authors

[13] P. Levy, M. Zirnsak, L. Michels, T. Moore, R. Kiani (2020). Asymmetric saccadic suppression: preserved luminance sensitivity along the saccade trajectory. *In preparation.*

[14] A. Baeshen, J. Villanueva, R. O'Gorman, A. Gantenbein, P. Sandor, F. Riederer, L. Michels (2020).

Interictal abnormalities in neurotransmission in patients with episodic migraine. *In preparation.*

[15] L. Michels*, A. Ciritis*, H. Pohl, S. Boettger (2020). Strucutral brain imaging based machine learning and its association to delirium. *In preparation.*

*Invited talks*

[1] Update in imaging in migraine and cluster headache. SFCNS Meeting. October 2019. Lausanne (Switzerland).

[2] New insights into stroke MR imaging. ZNZ Symposium. September 2019. Zurich (Switzerland).

[3] Structural Hyperconnectivity in Brain Regions for Number Line Processing and Memory in Children with Developmental Dyscalculia. ICMRI March 2019. Seoul (Korea).

[4] Multimodal imaging in migraine, cluster headache, and medication overuse headache (Nov. 2018). Preceptorship. Bad Zurzach (Switzerland).

[5] Multimodal imaging in MCI (Nov. 2018). Wöchentliche Klinikfortbildung des Departments Medizin. Kantonsspital Baden (Switzerland).

[6] Longitudinal changes of cerebral grey matter and blood flow in MCI ( Nov. 2017). 3$^{rd}$ Alpine Chapter Symposium (OHBM). Bern (Switzerland).

[7] Functional connectivity in cerebral pain and migraine ( Nov. 2017). 3$^{rd}$ Alpine Chapter Symposium (OHBM). Bern (Switzerland).

[8] Oxidative stress: The role of glutathione in the aging brain (March 2017). 13$^{th}$ Winter Brain & Heart Symposium. Sils Maria (Switzerland).

[9] The role of brain imaging in bladder control (Sept 2016). International Continence Society (ICS) Conference, Tokyo (Japan).

[10] Dynamic functional connectivity during brain development. (Jan. 2016). Lab seminar. Uddin Lab. University of Miami (USA).

[11] Pain modulation is affected differently in medication-overuse headache and chronic myofascial pain – Jahrestagung Schweizerische Neurologische Gesellschaft (Oct. 2015). Bern (Switzerland).

[12] The ageing brain: The relevance of multi-modal imaging. First NKO Research Day (2015). Zurich (Switzerland).

[13] Functional connectivity, perfusion, and task related fMRI changes in aMCI (March 2014). 10$^{th}$ Winter Brain Symposium. Sils Maria (Switzerland).

[14] Resting state fMRT und Kopfschmerz bei Medikamentenübergebrauch (rebound headache)- Hinweise auf gestörte Schmerzmodulation (2014). Dreiländertagung. Kopfschmerzsymposium im Gasteinertal. Bad Hofgastein (Austria).

[15] Supraspinal lower urinary tract control during urine withhold and micturition in healthy males — an fMRI study (2013). 76$^{th}$ Seminar des Arbeitskreises, Urologische Funktionsdiagnostik und Urologie der Frau. Hamburg (Germany).

[16] Functional and structural brain imaging changes during rest and cognition in the developing brain (2010). Stanford School of Medicine, Stanford University (USA).

[17] EEG during resting state and working memory in pain patients (2008). NYU Medical Center, New York University (USA).

[18] Working memory in adults (2008). Brain and Vision Research Laboratory, Boston University (USA).

*Book chapters*

[1] M. Lappe, L. Michels, H. Awater. Visual factors in perisaccadic compression of space (chapter 12). In: Problems of space and time in perception and action (Cambridge University Press).

[2] Electroencephalography (Chapter 21, pages 313-328). In: Neuroimaging Techniques in Clinical Practice: Physical Concepts and Clinical Applications. Springer. Oct. 2020.

*Reviewer - 59 peer-reviewed Journals*

*Journals*: Spatial Vision, Vision Research, NeuroImage, Journal (J.) of Urology, J. of Child Psychology and Psychiatry, J. of Pediatric Epilepsy, Neuroscience, Brain and Cognition, Cerebral Cortex, Brain Research, J. of Cognitive Neuroscience, PLoS ONE, European J. of Paediatric Neurology, Human Movement Science, J. of Visualized Experiments, J. of Neuroscience, Brain Topography, Neuroradiology, J. of Pain Research, Psychology and Neuroscience, J. Neurotrauma, J. of Neuroscience Research, BMJ Open, Psychiatry and Clinical Neurosciences, Australasian Physical and Engineering Sciences in Medicine (APES), Exp. Brain Res., Human Brain Mapping, Clin. Neurophys, Front Human Neurosci, Front in Systems Neuroscience, Front Integrative Neurosci, Front Psychiatry, Front Behav Neurosci, Biological Psychiatry, Scientific Reports, Psychopharmacology, MRM, Neurodegenerative Diseases, Neurobiology of Aging, Neurological Research, CNS Neuroscience & Therapeutics, Clinical Interventions in Aging, Alzheimer's and Parkinson's Diseases, Psychiatry Research: Neuroimaging, Psychological Medicine, PLOS Computational Biology, BJU International, Neuropsychiatric Disease and Treatment, Biomedical Engineering-Applications, Basis and Communications, Brain Imaging and Behavior, International J. of Psychophysiology, J. of Affective Disorders, J. of Neuroimaging, IEEE, PeerJ, Annals of Clinical and Translational Neurology, AJNR, Translational Psychiatry.

*Grant Reviewer*: German-Israeli Foundation for Scientific Research and Development, Wings for Life, Healthy Brains for Health Lives Program, McGill University (Canada).

*Editorial Work*: Frontiers in Human Neuroscience, Journal of Alzheimer's Disease (Associate Editor), Frontiers in Behavorial Neurosciene.

*Competetive Grants*

- Linking the major system markers for typical and atypical brain development: a multimodal imaging and spectroscopy study (01/2011-12/2013). Zurich Center for Integrative Human Physiology. 646'727 CHF (partner)

- Spectroscopy, voxel-based morphometry, and perfusion in migraine patients with aura. Forschungsstipendium (2013), Schweizerische Kopfwehgesellschaft. 5'000 CHF (main applicant)

- Anatomical alterations in vestibular migraine patients. Forschungsstipendium (2014), Schweizerische Kopfwehgesellschaft. 5'000 CHF (Tarnutzer, Riederer, Michels, Kollias, Palla)

- Anatomical alterations in vestibular migraine patients. Kötser Foundation (2015). 10'000 CHF (Tarnutzer, Riederer, Michels, Kollias, Palla)

- Impact of deafferentation on descending pain control systems. Swiss National Foundation (2017-2020). 429'000 CHF (Curt, Kollias, Michels)

- Investigating attention and visual brain processing through neurofeedback intervention. Swiss National Foundation (06/2019 - 06/2022). 423'926 CHF (main applicant)

- Treating patients with visual snow with non-invasive real-time functional MRI: a pilot study (02/2021 - 12/2022). 130'000 HF (main applicant)

*Non-competetive Grants*

- tDCS device for neuro-stimulation (2015). Investment credit (University of Zurich). 11'000 CHF (main applicant)

- Biopac recording system (2017). Investment credit (University of Zurich). 27'000 CHF (main applicant)

- Zusammenhang Delirium und Neurodegeneration (2017-2019). Stiftung zur Förderung der Alzheimer-Früherkennung. 15'000 CHF (main applicant)

- Multimodale Bildgebung zum Cluster-Kopfschmerz (2018-2020). Werner Dessauer Forschungsstipendium. 500'000 CHF (Sandor, Gantenbein, Michels).

- A randomized, double-blind, placebo-controlled proof of concept study to evaluate the efficacy and safety of a novel phyto-cannabinoid formulation in migraine prevention. 197,580 CHF (Agosti, Michels).

- MR-compatible EEG caps (2019). Investment credit (University of Zurich). 13'500 CHF (main applicant)

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**Total sum**: ca. 2'200'000 CHF

*Administrative work*

- head representative of the commission assistants/senior scientists at the Medical Faculty of the University of Zurich
- member of an Appeal Committee (OA representative) for two professorships "Multimodale Bildgebung und Systemelektrophysiologie bei MS" und "Strukturelle und zellulär/molekulare Magnetresonanztomographie bei MS"

*Memberships*

- OHBM (Organization for Human Brain Mapping, 2011-2021)
- ISMRM (International Society for Magnetic Resonance in Medicine 2011-2018)
- ICS (International Continence Society, 2016)

- SfN (Society for Neuroscience 2009-2018)
- INUS (International Neuro-Urology Society, since 2019)
- SKG (Schweizerischen Kopfwehgesellschaft, since 2018)

*Teaching*

- Neuroimaging block course (two-times per year, 2009-2020), University Hospital Zurich, Switzerland.
- EEG block course (two-times per year, since 2010), Child and Youth Psychiatry (KJPD), Zurich, Switzerland.
- Neuroradiology Journal club (bi-weekly, since 2010), University Hospital Zurich, Switzerland.
- Advanced spectroscopy course (April, 2013), ETH, Zurich, Switzerland.
- Neuradiological colloquium (two-times per year, 2010 - 2018), University Hospital Zurich, Switzerland.
- PhD course 'Swiss Graduate School for Cognition, Learning and Memory' (2-days, Spring 2014), Bern, Switzerland.
- MR-Fortgeschrittenenkurs III: Functional MRI and MR spectroscopy: clinical applications (2014/2016/2017/2018), Zurich, Switzerland

*Supervision: master students*

- K. Brenner. DTI after tDCS in migraine (07/2020). University of Zurich. Grade: 5.5 of 6.
- J. Sakar. Functional MRI in migraine (02/2020). University of Zurich. Grade: 5.5 of 6.
- J. Aschmann. Arterial spin labeling in migraine: The effects of tDCS (07/2018). University of Zurich. Grade: 6 of 6
- M. Meyer. Strukturelle Veränderungen und strukturelle Kovarianz bei Migräne (07/2017). University of Zurich. Grade: 5.5 of 6
- J. Villanueva. Magnetic resonance spectroscopy in migraine: The role of excitation and inhibition (2015). University of Zurich. Grade: 5.5 of 6

*Supervision: PhD students and postdoctoral fellows*

- J. Popovova (PhD). Impact of real-time fMRI on attention and vision, SNF project (since 07.2019). University of Zurich.
- R. Mazloum (PhD). Impact of real-time fMRI on attention and vision, SNF project (since 06.2019). ETH Zurich.
- G. Macauda (postdoc). Impact of real-time fMRI on attention and vision, SNF project (until 09.2020). University of Zurich.
- A. Baeshen (PhD). Methodological improvement of Detection Small Metabolites and Macromolecules in clinical MRS (defense March 2019). ETH Zurich.

- N. O. Aldusary (PhD). Investigations of the Lateral Geniculate Nucleus in terms of structure, function, connectivity (defense March 2019). University of Zurich.
- G. Rus (postdoc). Dual-task fMRI in mild cognitive impairment (since 2018). University of Zurich.
- G. Pamplona (PhD). Network-based fMRI-neurofeedback training applied to sustained attention (September 2018). University of Sao Paulo (Brazil). Grade: passed.
- V. Huynh (PhD). Advanced multimodal imaging in spinal cord injury (since 2017). University of Zurich.
- C. Schroeder (PhD). Morphological studies in dementia and substance dependence (2017). University of Zurich. Grade: magna cum laude.
- C. Schroeder (PhD). Morphological studies in dementia and substance dependence (2017). University of Zurich. Grade: magna cum laude.
- J. Brand (PhD). Using visual feedback to modulate motor performance and its neural correlates (2016). ETH Zurich. Grade: passed.
- G. Macauda (PhD). Using visual feedback to modulate motor performance and its neural correlates (2016). University of Zuric
- R. Buechler (PhD). Altered Structural Covariance in Subjects at Risk for Psychosis (since 2014). University of Zurich.
- S. Shlomo Poil (postdoc). EEG-fMRI during brain development and ADHD (2012-2014). University Children's Hospital Zurich.

*Awards*

- ICMRI Conference 2019 (Seoul, Korea), Scholarship (500 USD).
- Winner of the Eugen-Rehfisch-Price (3'000 Euro), Best oral presentation, 2012, Zurich, Switzerland.
- Poster price, bronze medal, ESMRN conference, 2011, Amsterdam, Netherlands.
- Poster price (300 CHF), Children's University Hospital, 2010, Zurich, Switzerland.

*Scientific and clinical focus*

- fMRI, EEG, EEG-fMRI, PET-MR, DTI, (dynamic) ASL-MRI, GABA-MRS, tDCS, iVASO, BBB, QSM, APT, real-time fMRI, structural and functional connectivity.
- dementia, migraine, cluster headache, tumour, ADHD, dyscalculia, epilepsy, PTSD, psychosis, stroke, preterm-born infants, cocaine abuse.

Zürich, 07 January 2020

Lars Michels